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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,911	10/19/2001	Salvatore Nicholas Storino	ROC920010285US1	1410

7590 02/19/2004

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EXAMINER
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SUN, XIUQIN

ART UNIT	PAPER NUMBER
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2863

DATE MAILED: 02/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/045,911

Applicant(s)

STORINO, SALVATORE  
NICHOLAS

Examiner

Xiuqin Sun

Art Unit

2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 February 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 3, 12-14 and 19-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12-14 and 19-21 is/are allowed.
- 6) ☒ Claim(s) 3 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Response to Amendment*

1. Based on the newly found prior art the finality of the office action of 12/02/2003 is hereby withdrawn and replaced by the following office action.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flanagan et al. (U.S. Pub. No. 2003/0014150 A1) in view of Kou (U.S. Pub. No. 2003/0030429 A1), Ramamurthi (U.S. Pat. No. 5251144) and Stals et al. (U.S. Pat. No. 5646540).

Flanagan et al. teach an apparatus that provides at least one estimated effective age of a product during the entire life of the product (sections 0009 and 0010), comprising: at least one sensor equipped on the product that provides data about the operating condition of said product (sections 0025 and 0029); a device equipped on the product that uses said data to calculate an age acceleration factor for said product for at least one of said sensors (sections 0009 and 0027-0029); at least one accumulator equipped on the product that provides the estimated effective age for said product, based upon said age acceleration factor (sections 0009 and 0027-0029); and a display

capable of presenting said estimated effective age to a user of said product (sections 0031 and 0032).

Flanagan et al. do not mention explicitly that: said sensor provides data about an environmental condition; said sensor includes an analog to digital conversion function; said device is a digital processor programmed to use said data to calculate an Arrhenius estimation of said age acceleration factor; and said display is equipped on the product.

Kou teaches an apparatus that provides at least one estimated effective age of a product (abstract; sections 0003-0005), comprising: at least one sensor that provides data about an environmental condition (sections 0015, 0023, 0044, and 0076); a computing device that computes an age acceleration factor for each of the environmental conditions sensed, using a model that relates the environmental condition to the age acceleration factor (sections 0044, 0048-0056, and 0070-0072).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teachings of Kou environmental condition sensor and the computing device in the Flanagan apparatus and method in order to include the impact of environmental conditions in estimating the effective age of said product (Flanagan et al., section 0025; Kou, section 0023 and 0044).

Ramamurthi discloses a system for predicting the life of a cutting tool, and teaches: a plurality of sensors that include an analog to digital conversion function (col. 4, lines 1-19).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Ramamurthi analog to digital converter in

the apparatus and method of Flanagan et al. and Kou in order to convert the sensed analog signals to digital signals so that the signals can be processed by the digital computer (Ramamurthi, col. 4, lines 1-19).

Stals et al. disclose an apparatus and method for measuring electromagnetic ageing parameter of a circuit element and predicting its values, and teach: a digital processor programmed to use sensed data to calculate an Arrhenius estimation of an age acceleration factor for a product (col. 6, lines 54-62 and col. 10, lines 7-29).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Stals et al. Arrhenius estimation in the invention of Flanagan in order to model an *Arrhenius*-type ageing mechanism for a thermal ageing process of a product (Stals et al., col. 10, lines 7-29).

It would also have been obvious to one of ordinary skill in the art at the time the invention was made to mount the display on the product, together with the Flanagan computing device, in order to make it easier and more efficient to monitor the remaining lifetime of said product, since it is a well known technology in the art that a display terminal can be attached to a microcomputer. It is held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70 (CCPA 1950).

***Allowable Subject Matter***

4. Claims 12-14 and 19-21 are allowed.

***Reasons for Allowance***

5. The following is an examiner's statement of reasons for allowance:

The primary reason for the allowance of claims 12-14 is the inclusion of the limitation that said device that uses said data to calculate an age acceleration factor for said product is a VCO, said VCO producing a VCO output signal having a frequency that varies substantially exponentially responsive to a linear voltage change on an input of the VCO. It is this limitation found in each of the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

The primary reason for the allowance of claim 19 is the inclusion of the limitation that said digital processor is programmed to compute a Hallberg-Peck estimate of age acceleration. It is this limitation found in the claim, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes the claim allowable over the prior art.

The primary reason for the allowance of claim 20 is the claimed step of computing an age acceleration factor that comprises the use of the Arrhenius equation, the Hallberg-Peck equation, or the Coffin-Manson equation. It is this step found in the claim, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes the claim allowable over the prior art.

The primary reason for the allowance of claim 21 is the claimed steps of: computing a normalized effective age for some or all of the effective ages by dividing the instant effective age by a wall clock age; computing an effective life used value for

some or all of the effective ages by dividing the instant effective age by a predetermined estimate of life of the product; and computing an effective life remaining value for some or all of the effective ages by subtracting said effective life used value from "1 ". It is these steps found in the claim, as they are claimed in the combination, that have not been found, taught or suggested by the prior art of record which make the claim allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

#### ***Prior Art Citations***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- 1) Gazdzinski (U.S. Pat. No. 5902962) discloses Cable and method of monitoring cable aging.
- 2) Gazdzinski (U.S. Pat. No. 6300634) discloses method and apparatus for measuring the condition of degradable components.
- 3) Bigelow et al. (U.S. Pat. No. 6481670) disclose an apparatus for spacecraft thermal management.

#### ***Contact Information***

Art Unit: 2863


7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xiuqin Sun whose telephone number is (571)272-2280.


The examiner can normally be reached on 7:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571)272-2269. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Xiuqin Sun  
Examiner  
Art Unit 2863

  
XS  
February 17, 2004

  
John Barlow  
Supervisory Patent Examiner  
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